

REMARKS

In the Claims:

Reconsideration and further examination of the subject patent application in light of the present Amendment and Remarks is respectfully requested. Claims 1-24 are currently pending in the application and stand rejected. New claim 25 has been added. No new matter has been added.

Rejection Under 35 U.S.C. §102

Claims 1, 2, 7-9, 13, 14, and 19-21 stand rejected under 35 U.S.C. §102 as being anticipated by Suh (2003/0219244). In view of the remarks, applicant respectfully traverses this rejection.

Claim 1 recites various structures, including a lens 16 and a lens frame 17, which supports the lens. The lens frame 17 includes hanger shaft hole 19. A chassis 3 includes an integrally formed hanger shaft 12. The hanger shaft 12 fits into the hanger shaft hole 19 to support the lens frame 17 so that the lens frame can reciprocally move relative to the chassis. The shaft essentially “guides” the lens frame. The hanger shaft 12 has a plurality of outside diameters (Figs. 4-7) which correspond to inside diameters in the hanger shaft hole. Thus, the hanger shaft 12 having multiple outside diameters, fits within the hanger shaft hole 19 having corresponding multiple inside diameters, and permits movement of the lens frame 17, and hence the lens itself 16, to achieve proper focusing of the lens.

Because of the configuration and fit of the hanger shaft 12 and corresponding hanger shaft hole 19, is possible to adjust the lens focus with a high degree of accuracy (specification, p.3, para. [0007]). The multi-diameter configuration of the shaft, with the smaller diameter located at its distal end, provides several advantages. First, it is easier to align the tip of the shaft

with the entrance of the hanger shaft hole, because it is smaller in diameter. Thus, the tip of the shaft can be quickly and positively inserted into the hanger shaft hole without regard to the general tilt angle of the lens frame 17 during assembly. Second, once the hanger shaft 12 is fully inserted into the hanger shaft hole 19, the wide diameter portion d_1 (Fig. 4) of the hanger shaft mates with the corresponding wide diameter portion d_3 (Fig. 4) of the hanger shaft hole. Similarly, the narrow diameter portion d_2 (Fig. 4) of the hanger shaft mates with the corresponding narrow diameter portion d_4 (Fig. 4) of the hanger shaft hole.

Generally, smaller diameter components can be formed or machined with greater tolerance and accuracy than corresponding components having a larger size. Thus, the wider diameter portions may provide strength and coarse adjustment capability, while the smaller diameter portions permit fine adjustment. This permits controlled and accurate movement of the lens frame 17 as the hanger shaft hole 19 moves relative to shaft 12 of the chassis 3. Accordingly, independent claim 1 clearly requires a multi-diameter shaft and a corresponding multi-diameter hole, which permit the lens frame 17 to move relative to the chassis 3. New claim 25 has similar limitations.

The Examiner cites Suh as having all of the elements of claim 1. However, Suh is clearly missing both the multi-diameter shaft and a corresponding multi-diameter hole, which permit the lens frame to reciprocally move along the optical axis. Suh discloses that the first lens barrel 45 is fitted into multiple lens shafts 57, thereby allowing reciprocal movement along the optical axis (Suh, para [0056]). In Fig. 7 of Suh, two lens shafts 57 are clearly shown as elongated cylindrical structures having a single unvarying diameter along their entire length. Suh also discloses that the second lens barrel 79 is fitted into multiple lens shafts 81, thereby allowing reciprocal movement along the optical axis (Suh, para [0656]). Again, Fig. 10 of Suh clearly shows that the

two lens shafts 81 are elongated cylindrical structures having a single unvarying diameter along their entire length. The lens shafts 57 and 81 are not multi-diameter structures, as required by claim 1. Such elements are not taught, disclosed or suggested by the Suh reference.

The Examiner appears to suggest that Suh includes shafts having multiple diameters. Applicant disagrees and cannot find any such disclosure in the specification or drawings. The applicant does not understand the Examiner's reference to unspecified or non-numbered structures, and respectfully requests additional clarification. The Examiner states that the hanger shaft hole is shown in Fig. 2 of Suh surrounding an unnumbered shaft (Office Action, p.2). Applicant does not discern any such structure. The lens barrels 45 and 79 are the structures that have the holes that receive the shafts 57 and 81.

The Examiner also states that the hanger shafts of Suh have a plurality of diameters, and suggests that in Fig. 5 of Suh, the unnumbered shaft has a large diameter and a small diameter, and that the shaft fits into the shaft hole shown in Fig. 2. Applicant respectfully submits that the Examiner is misperceiving the structure of the Suh device. The shafts in Suh, which permit movement of the lens along the optical axis, are clearly numbered as 57 in Fig. 7 and 81 in Fig. 10. These shafts are "guide shafts," and have a single diameter. There are no shafts and corresponding shafts holes in Suh having multiple diameters that permit two components to move relative to each other along the optical axis. Applicant respectfully requests that the Examiner provide a hand marked up drawing from Suh to clarify the rejection. Because these elements are completely missing in Suh, applicant submits that Suh cannot anticipate applicant's claimed invention.


Rejection Under 35 U.S.C. §103

Claims 1-24 stand rejected under 35 U.S.C. §103 as being unpatentable over Suh in view of various combinations to Tereda (2005/0185951), Hayakawa (7,206,109), Johnson (5,861,564), and Kanno (5,712,734). In view of the remarks, applicant respectfully traverses this rejection. Applicant reasserts the above argument set forth under §102 to traverse the rejection under §103. None of the cited secondary references provide the elements missing from Suh, such as the guide shafts having multiple diameters and the corresponding hanger shaft hole. Combining Suh, which lacks any teaching or suggestion of guide shafts having multiple diameters and the corresponding hanger shaft holes, with any of the secondary references, which similarly lack such teaching or suggestion, fails to yield applicant's claimed invention. Accordingly, applicant submits that the cited references, either individually or in combination, do not render applicant's claimed invention obvious.

Summary

Pending claims 1-25 are believed to be patentable. Applicant respectfully requests the Examiner grant early allowance of this application. The Examiner is invited to contact the undersigned attorneys for the applicant via telephone if such communication would expedite this application.

Respectfully submitted,



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